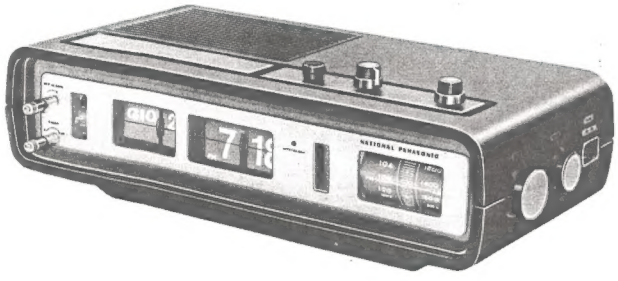
Service Manual

NATIONAL
RADIO
PANASONIC

FM-AM DIGITAL CLOCK RADIO WITH DAY AND DATE CALENDAR

MODEL RC-707B



■ SPECIFICATIONS

Frequency Range:	FM 87.5～108 MHz AM 525～1605 kHz (571～187m)
Intermediate Frequency:	FM 10.7 MHz AM 455 kHz
Sensitivity:	FM 5μV for 50mW output AM 100μV/m for 50mW output
Power Output:	1W Maximum
Power Source:	AC 220V 50 Hz
Power Consumption:	10 W at 220 V
Speaker:	10cm (4") PM Dynamic Speaker
Dimensions:	357(Wide)×122(High)×182(Deep) mm (14 1/16"×4 13/16"×7 5/32")
Weight:	2.35 kg. (5 lb. 3 oz.)
Impedance:	Speaker ..... 8Ω Earphone Jack ..... 8Ω FM Antenna Terminal 75Ω

■ TO REMOVE CHASSIS

1. Remove tuning & volume knob from cabinet.
2. Remove eight (8) cover and clock screws, nos. 1～8, as illustrated in fig. 1.
3. Remove six (6) red chassis screws, nos. 3～8, as illustrated in fig. 2.
4. To remove chassis completely, pull out plugs and unsolder leadwires to lead holder.
5. To reassemble, reverse the above procedure.

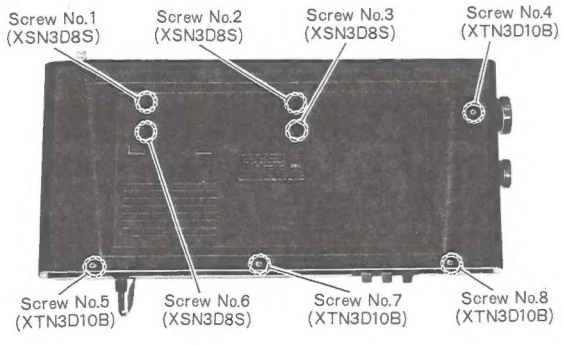


Fig. 1

■ TO REMOVE CLOCK

1. Remove three (3) clock knob from cabinet.
2. Remove eight (8) cover and clock screws, nos. 1～8, as illustrated in fig. 1.
3. Remove two (2) clock screws, nos. 1～2,as illustrated in fig. 2.
4. Remove escutcheon & panel.
5. Remove two lead holder from clock.
6. To remove clock completely, unsolder leadwires to clock selector switch, lead holder, speaker terminal and connector.
7. To reassemble, reverse the above procedure.

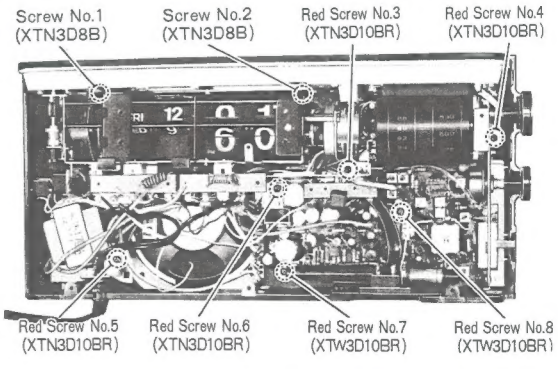
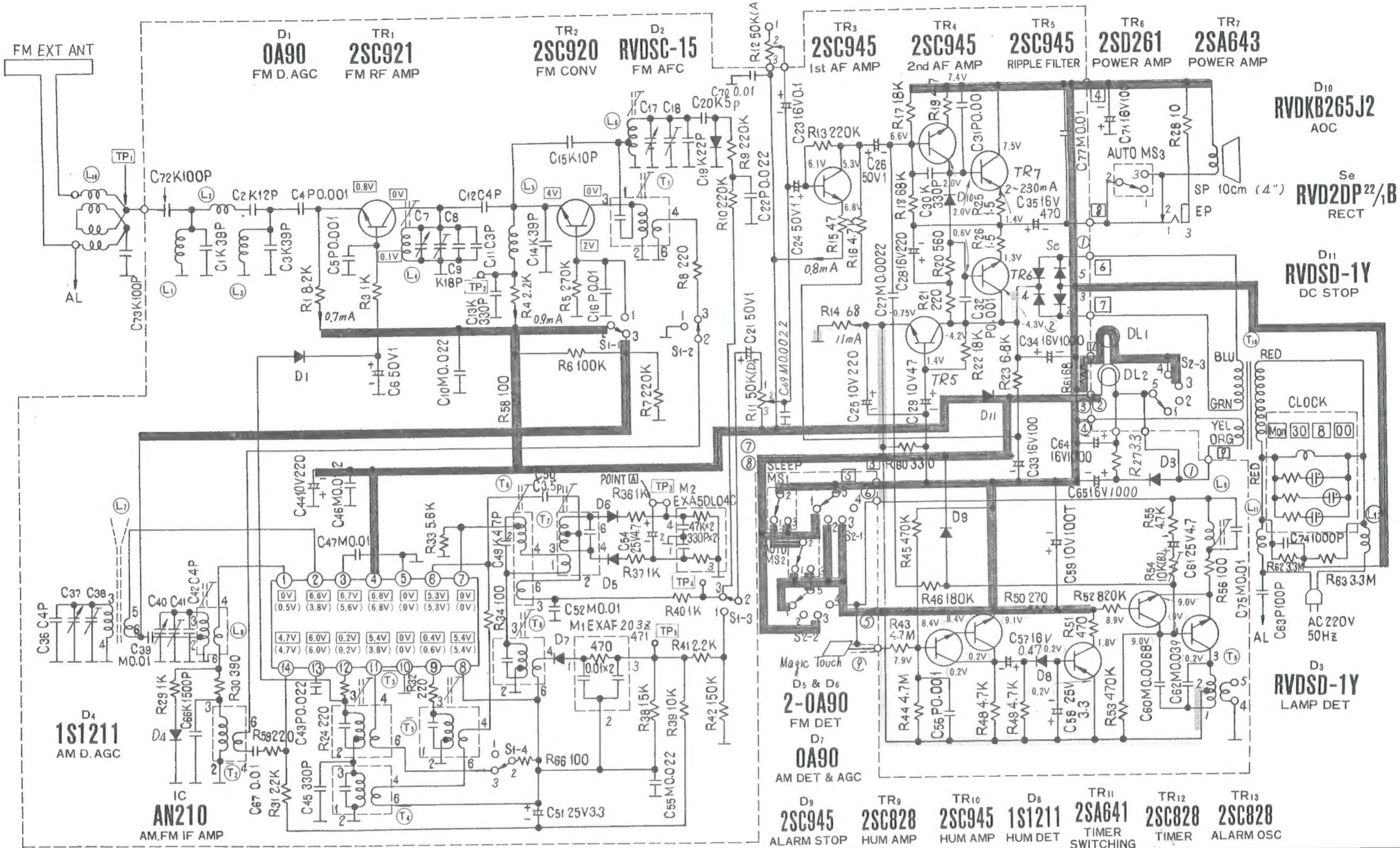


Fig. 2

MATSUSHITA ELECTRIC
MATSUSHITA ELECTRIC TRADING CO., LTD.
P. O. Box 288, Central Osaka, Japan

ORDER NO. RD-811

Schematic Diagram – Model RC-707B

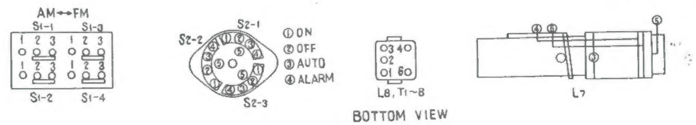


C	72 73 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 69 70 25 26 27 28 29 30 31 32 33 34 35 64 65 77 71
	36 37 38 39 40 41 42 66 67 43 44 45 46 47 49 50 51 52 54 55 56 57 58 59 60 61 62 75 63 74
R	1 3 4 58 5 6 7 8 9 10 11 12 13 14 15 16 60 17 18 19 20 21 22 23 25 26 27 61 28
	29 30 59 31 24 32 33 34 66 36 37 38 39 40 41 42 43 44 45 46 48 49 50 51 52 53 54 55 56 62 63

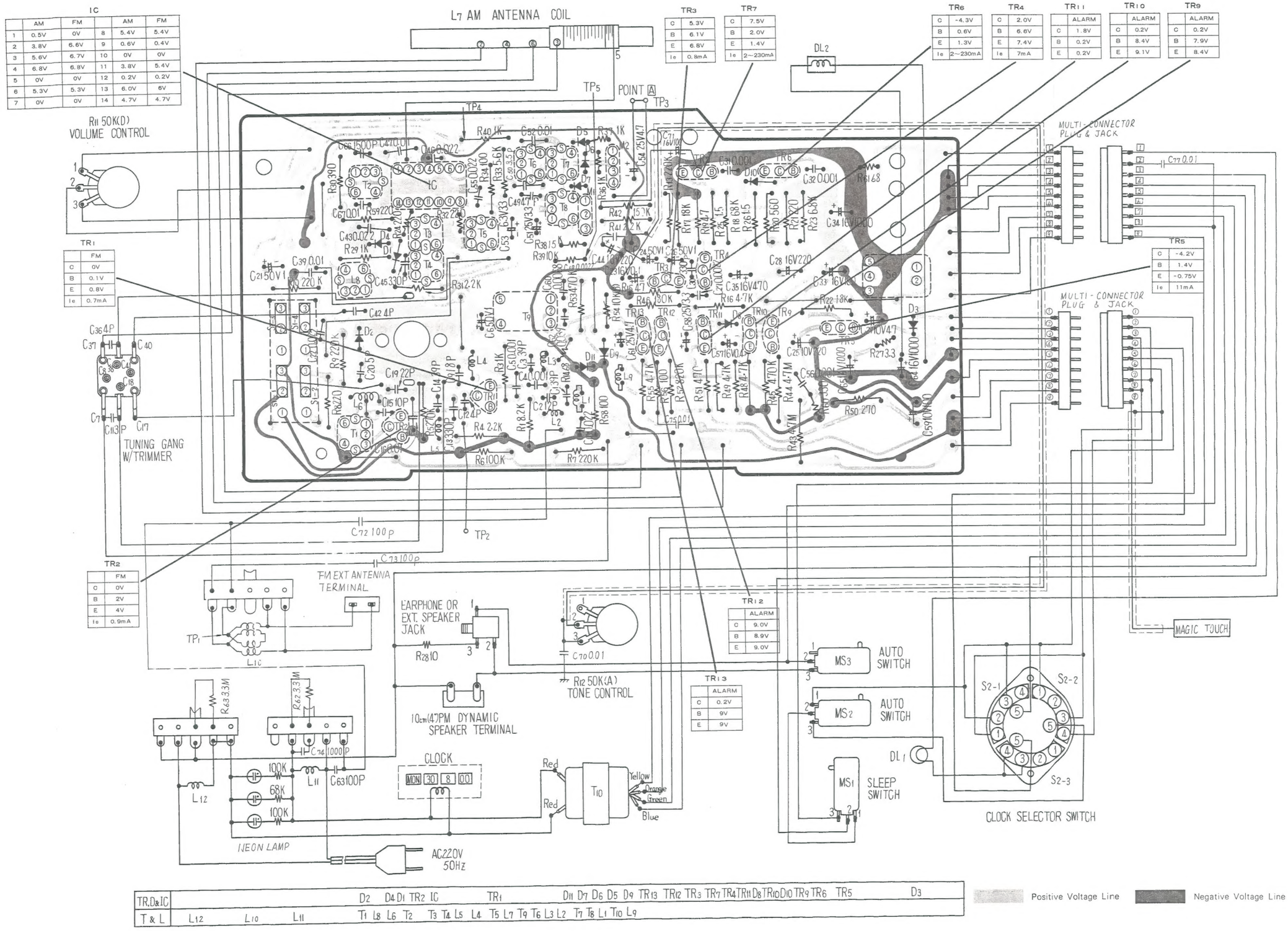
Positive Voltage Line   Negative Voltage Line

Notes:

1. S_{1-1}~S_{1-4}: Band selector switch in "FM" position.
2. S_{2-1}~S_{2-3}: Clock selector switch in "ON" position.
3. DC voltage measurements are taken with circuit tester 10 kΩ/V from chassis.
   □......FM position   ( )......AM position.
   〈 〉......Alarm position.



Circuit Board Wiring View–Model RC-707B



IC					
	AM	FM		AM	FM
1	0.5V	0V	8	5.4V	5.4V
2	3.8V	6.6V	9	0.6V	0.4V
3	5.6V	6.7V	10	0V	0V
4	6.8V	6.8V	11	3.8V	5.4V
5	0V	0V	12	0.2V	0.2V
6	5.3V	5.3V	13	6.0V	6V
7	0V	0V	14	4.7V	4.7V

TR3	
C	5.3V
B	6.1V
E	6.8V
Ie	0.8mA

TR7	
C	7.5V
B	2.0V
E	1.4V
Ie	2~230mA

TR6	
C	-4.3V
B	0.6V
E	1.3V
Ie	2~230mA

TR4	
C	2.0V
B	6.6V
E	7.4V
Ie	7mA

TR11	
	ALARM
C	1.8V
B	0.2V
E	0.2V

TR10	
	ALARM
C	0.2V
B	8.4V
E	9.1V

TR9	
	ALARM
C	0.2V
B	7.9V
E	8.4V

TR1	
	FM
C	0V
B	0.1V
E	0.8V
Ie	0.7mA

TR5	
C	-4.2V
B	1.4V
E	-0.75V
Ie	11mA

TR2	
	FM
C	0V
B	2V
E	4V
Ie	0.9mA

TR12	
	ALARM
C	9.0V
B	8.9V
E	9.0V

TR13	
	ALARM
C	0.2V
B	9V
E	9V

TR,D&IC	D2	D4 D1	TR2	IC	TR1	D11 D7 D6 D5 D9	TR13	TR12	TR3	TR7	TR4	TR11	D8	TR10	D10	TR9	TR6	TR5	D3
T & L	L12	L10	L11	T1	L8	L6	T2	T3	T4	L5	L4	T5	L7	T9	T6	L3	L2	T7	T8	L1	T10	L9

Positive Voltage Line Negative Voltage Line

■ ALIGNMENT INSTRUCTIONS

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Notes:
1. Set volume control to maximum or minimum (FM-IF).
2. Set tone control to treble.
3. Set clock selector switch to ON.
4. Set band selector switch to AM or FM.
5. Set power source voltage to 120 volts AC.
6. Output of signal generator should be no higher than necessary to obtain an output reading.

	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING (DISTANCE)	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTION S	FREQUENCY				
	AM ALIGNMENT					
1	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. with 400 Hz.	Point of non-interference. (on/about 600 kHz)	Output meter across voice coil.	T_2 (1st IFT) T_4 (2nd IFT) T_8 (3rd IFT)	Adjust for maximum output.
2	〃	550 kHz	550 kHz (Refer to fig. 1)	〃	L_8 (OSC Coil) (＊)L_7 (ANT Coil)	Adjust for maximum output. Adjust L_7 by moving coil bobbin along ferrite core.
3	〃	1500 kHz	1500 kHz (Refer to fig. 2)	〃	C_{41} (OSC Trimmer) C_{38} (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
	＊Cement antenna bobbin with wax after completing alignment.					
	FM-IF ALIGNMENT					
4	High side thru. 0.001mfd to point **TP2**. Common to chassis.	10.7 MHz (400 kHz SWP.)	Point of non-interference. (on/about 100 MHz).	Connect vert. amp. of scope to point **TP3**, (＊) Common to chassis.	T_1 (FM 1st IFT) T_3 (FM 2nd IFT) T_5 (FM 3rd IFT) T_6 (FM 4th IFT) (Primary)	Adjust for maximum amplitude and proper linearity between ±100 kHz markers. (Refer to fig. 5)
5	〃	〃	〃	Connect vert. amp. of scope to point **TP4**. Common to chassis.	T_7 (FM 4th IFT) (Secondary)	Adjust T_7 so that 10.7 MHz marker appears at the center. (Refer to fig. 6)
	＊Unsolder lead between test point **TP3** and point Ⓐ before alignment and resolder it after alignment.					
	FM-RF ALIGNMENT					
6	Connect to point **TP1** through FM Dummy antenna. (Refer to fig. 7)	90 MHz	90 MHz (Refer to fig. 3)	Output meter across voice coil.	L_6 (FM OSC Coil) L_4 (FM DET Coil)	(＊)Adjust for maximum output.
7	〃	106 MHz	106 MHz (Refer to fig. 4)	〃	C_{18} (FM OSC Trimmer) C_8 (FM DET Trimmer)	(＊)Adjust for maximum output. Repeat steps (6) and (7).
	＊Three output responses will be present; proper tuning is the center frequency.					

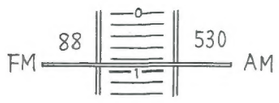


Fig. 1 550 kHz Marking

Fig. 3 90 MHz Marking

Fig. 5

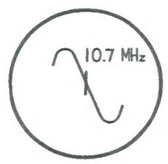


Fig. 6

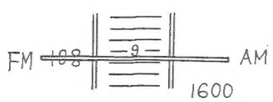


Fig. 2 1500 kHz Marking

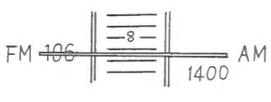


Fig. 4 106 MHz Marking

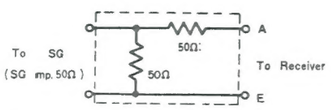
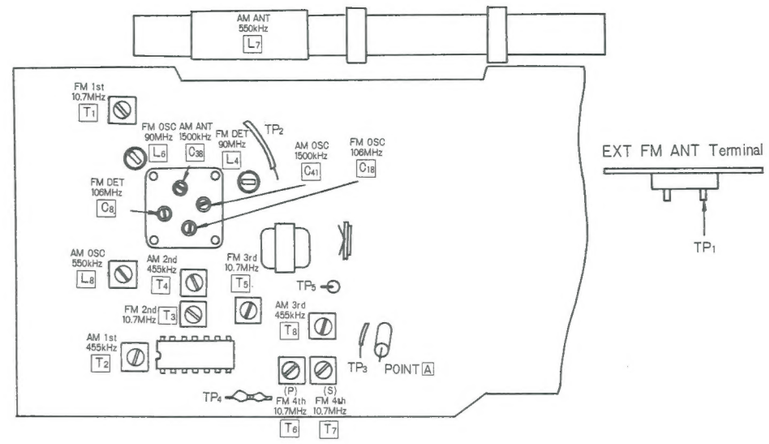


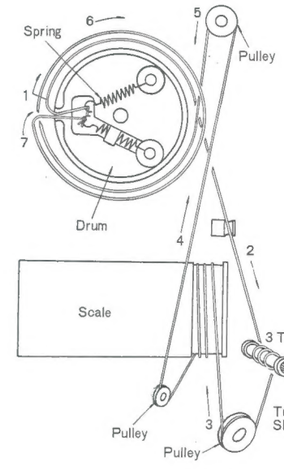
Fig. 7 FM Dummy Antenna

■ ALIGNMENT POINTS



■ DIAL CORD INSTALLATION GUIDE

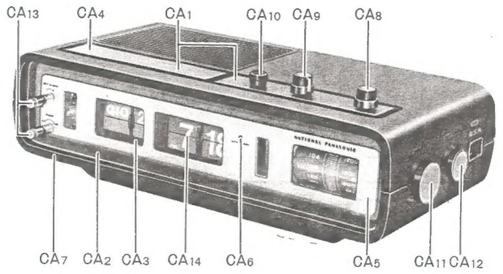
1. Dial cord length is 150cm (59 1/16").
2. Tuning gang is positioned at minimum capacity.
3. Arrows (1～7) indicate correct order and direction of installation dial cord.
4. Cement dial cord end.



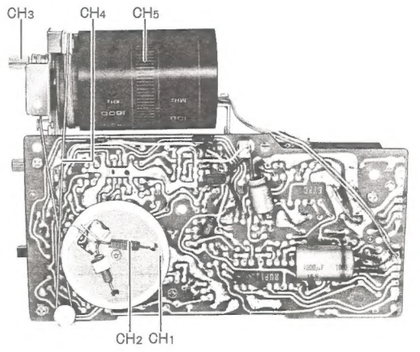
■ DIAL SCALE ADJUSTMENT

1. Set tuning gang fully closed position.
2. Set start point of dial scale to white line of panel.

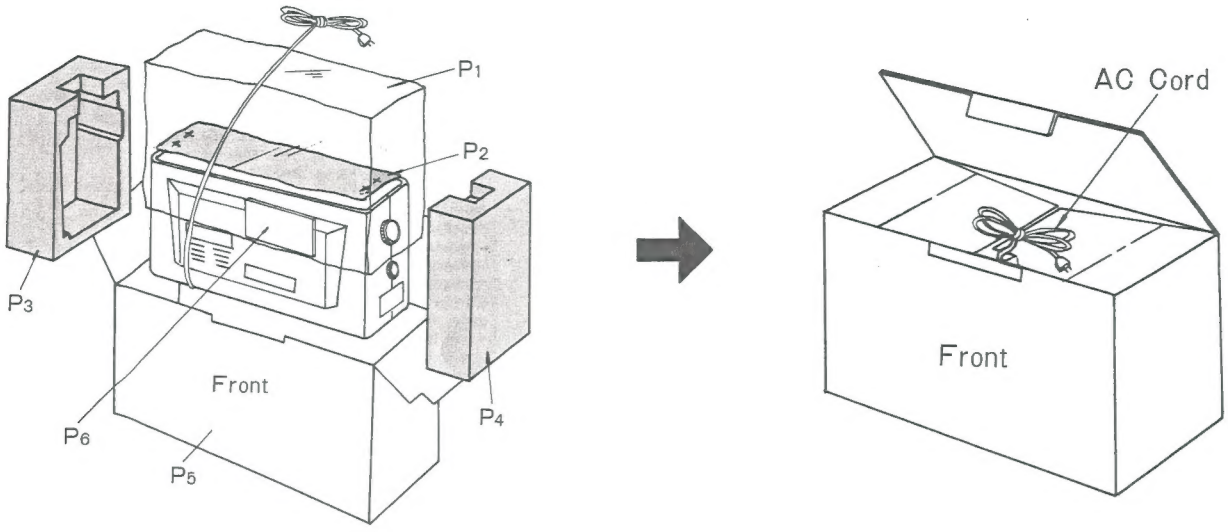
■ CABINET PARTS LOCATIONS



■ CHASSIS PARTS LOCATIONS



■ PACKING PARTS LOCATIONS



■ REPLACEMENT PARTS LIST

NOTES : 1. Part numbers are indicated on most mechanical parts.
Please use this part numberfor parts orders.
2. Ⓝ indicates the New Parts.
3. **A—C** rank: **A** rank parts will cover 80% of repair needs.
A+B rank parts will cover 95% of repair needs.
C rank parts are less necessary.

Ref.No.	Part No.	Description	Per Set (Pcs.)	Remarks
INTEGRATED CIRCUITS, TRANSISTORS AND DIODES				
IC	AN210	FM & AM IF Amplifier	1	A
TR1	2SC921	FM RF Amplifier	1	A
TR2	2SC920	FM Converter	1	A
TR3,4,5,10	2SC945	1st, 2nd AF Amplifier, Ripple Filter	5	A
D9		Hum Amplifier, Alarm Oscillator Stop		
TR6	2SD261	Power Amplifier	1	A
TR7	2SA643	Power Amplifier	1	A
TR9,12,13	2SC828	Hum Amplifier, Timer, Alarm Oscillator	3	A
TR11	2SA641	Timer Switching	1	A
D1,7	0A90	FM D. AGC, AM Detector & AGC	2	A
D2	RVDSC-15	FM AFC	1	A
D3,11	RVDSD-1Y	Lamp Detector, DC Stop	2	A
D4,8	1S1211	Hum Detector, AM D. AGC	2	A
D5,6	2-0A90	FM Detector	1 pair	A
D10	RVDKB265J2	Operation Compensator	1	A
RECTIFIER				
Se	RVD2DP22/1B	Rectifier	1	A
COILS AND TRANSFOMERS				
L1,2,3	RLQY10S5	FM Choke Coil	3	B
L4	RLD4N11	FM Detector Coil	1	A
L5	RLQY75S5	FM Choke Coil	1	B
L6	RL04N45	FM Oscillator Coil	1	A
L7	RLF2D80-0	AM Antenna Coil	1	Ⓝ A
L8	RL02B77-M	AM Oscillator Coil	1	A
L9	RLM1X1-Y	Choke Coil	1	B
L10	RLA4Z2-0	FM Antenna Coil	1	A
T1	RLI4B152	1st FM IF Transformer	1	A
T2	RLI2B152-M	1st AM IF Transformer	1	A
T3,5	RLI4B351	2nd, 3rd FM IF Transformer	2	A
T4	RLI2B257-M	2nd AM IF Transformer	1	A
T6	RLI4B551	4th FM IF Transformer, Primary	1	A
T7	RLI4B552	4th FM IF Transformer, Secondary	1	A
T8	RLI2B450-M	3rd AM IF Transformer	1	A
T9	RLT2D7-W	Alarm Oscillator Transformer	1	A
T10	RLT5J81-W	Power Transformer	1	Ⓝ A
RESISTORS				
R25,26	ERD14SJ1R5	1.5Ω, ¼Watt, Carbon	2	B
R19	ERD14SJ4R7	4.7Ω, ¼Watt, Carbon	1	B
R15	ERD14SJ470	47Ω, ¼Watt, Carbon	1	B
R34,56,58	ERD14SJ101	100Ω, ¼Watt, Carbon	3	B
R8,21,59	ERD14SJ221	220Ω, ¼Watt, Carbon	3	B
R50	ERD14SJ271	270Ω, ¼Watt, Carbon	1	B
R30	ERD14SJ391	390Ω, ¼Watt, Carbon	1	B
R51	ERD14SJ471	470Ω, ¼Watt, Carbon	1	B
R20	ERD14SJ560	56Ω, ¼Watt, Carbon	1	B
R3,29,40	ERD14SJ102	1KΩ, ¼Watt, Carbon	3	B
R16,48,49,55	ERD14SJ472	4.7KΩ, ¼Watt, Carbon	4	B
R33	ERD14SJ562	5.6KΩ, ¼Watt, Carbon	1	B
R23	ERD14SJ682	6.8KΩ, ¼Watt, Carbon	1	B
R1	ERD14SJ822	8.2KΩ, ¼Watt, Carbon	1	B
R4,31,41	ERD14SJ222	2.2KΩ, ¼Watt, Carbon	3	B
R17,22	ERD14SJ183	18KΩ, ¼Watt, Carbon	2	B
R18	ERD14SJ683	68KΩ, ¼Watt, Carbon	1	B
R6	ERD14SJ104	100KΩ, ¼Watt, Carbon	1	B
R7,9,10,13	ERD14SJ224	220KΩ, ¼Watt, Carbon	4	B
R5	ERD14SJ274	270KΩ, ¼Watt, Carbon	1	B
R45,53	ERD14SJ474	470KΩ, ¼Watt, Carbon	2	B
R52	ERD14SJ824	820KΩ, ¼Watt, Carbon	1	B
R46	ERD14SJ184	180KΩ, ¼Watt, Carbon	1	B
R42	ERD14SJ154	150KΩ, ¼Watt, Carbon	1	B
R28	ERC12GM100	10Ω, ½Watt, Solid	1	B
R43,44	ERC12GM475	4.7MΩ, ½Watt, Solid	2	B
R60	ERC12GM331	330Ω, ½Watt, Solid	1	B
R62,63	ERC12GM335	3.3MΩ, ½Watt, Solid	2	B
R32	ERD14VK221	220Ω, ¼Watt, Carbon	1	B
R36,37	ERD14VK102	1KΩ, ¼Watt, Carbon	2	B
R27	ERD14VK3R3	3.3Ω, ¼Watt, Carbon	1	B
R14,61	ERD14VK680	68Ω, ¼Watt, Carbon	2	B
R39	ERD14TK103	10KΩ, ¼Watt, Carbon	1	B
R38	ERD14VK153	15KΩ, ¼Watt, Carbon	1	B
R24	ERD14TK221	220Ω, ¼Watt, Carbon	1	B
R66	ERD14TK101	100Ω, ¼Watt, Carbon	1	B
VARIABLE RESISTORS				
R12	EVCB0AL20A54	50KΩ (A), Tone Control	1	A
R11	EVCS0AL20D54	50KΩ (D), Volume Control	1	A
R54	EVLT0AA00B14	10KΩ (B), Alarm Cycle Control	1	A
CAPACITORS				
C11	ECCD05030C	3mmf, 50WV, Ceramic	1	C
C12,36,42	ECCD05040C	4mmf, 50WV, Ceramic	3	C
C20	ECCD05050CC	5mmf, 50WV, Ceramic	1	C
C13,30,45	ECCD05331K	330mmf, 50WV, Ceramic	3	C
C50	ECCD053R5C	3.5mmf, 50WV, Ceramic	1	C
C9	ECCD05180KC	18mmf, 50WV, Ceramic	1	C
C4,5,31,32, 56	ECKD05102P	0.001mfd, 50WV, Ceramic	5	C
C16	ECKE05103P	0.01mfd, 50WV, Ceramic	1	C
C39,47,52,70, 77	ECKE05103MY	0.01mfd, 50WV, Ceramic	5	C
C22,43	ECKE05223P	0.022mfd, 50WV, Ceramic	2	C
C63	ECKD14101P	100mmf, 2800WV, Ceramic	1	C
C74	ECKD14102P	1000mmf,2800WV, Ceramic	1	C
C19	ECMS05220K-H	22mmf, 50WV, Mica	1	C
C49	ECMS05470K-H	47mmf, 50WV, Mica	1	C
C1,3,14	ECMS05390K-H	39mmf, 50WV, Mica	3	C
C2	ECMS05120K-H	12mmf, 50WV, Mica	1	C

Ref.No.	Part No.	Description	Per Set (Pcs.)	Remarks
C15	ECMS05100K-H	10mmf, 50WV, Mica	1	C
C72,73	ECMS05101K-H	100mmf, 50WV, Mica	2	C
C27,69	ECQG05222MZ-N	0.0022mfd, 50WV, Polyester	2	C
C60	ECQG05682MZ-N	0.0068mfd, 50WV, Polyester	1	C
C67,75	ECQG05103MZ-N	0.01mfd, 50WV, Polyester	2	C
C10,46,55	ECQG05223MZ-N	0.022mfd, 50WV, Polyester	3	C
C62	ECQG05393KZ-N	0.039mfd, 50WV, Polyester	1	C
C66	ECQS05152KZ	1500mmf, 50WV, Styrol	1	C
C29	ECEA10V47	47mfd, 10WV, Electrolytic	1	B
C25,44	ECEA10V220	220mfd, 10WV, Electrolytic	2	B
C33,71	ECEA16V100	100mfd, 16WV, Electrolytic	2	B
C28	ECEA16V220	220mfd, 16WV, Electrolytic	1	B
C35	ECEA16V470	470mfd, 16WV, Electrolytic	1	B
C34,64,65	ECEA16V100OL	1000mfd, 16WV, Electrolytic	3	B
C51,58	ECEA25V3R3	3.3mfd, 25WV, Electrolytic	2	B
C61	ECEA25V4R7	4.7mfd, 25WV, Electrolytic	1	B
C6,21,24,26	ECEA50V1	1mfd, 50WV, Electrolytic	4	B
C23	ECEAG16ER1	0.1mfd, 16WV, Electrolytic	1	B
C57	ECEAG16ER47	0.47mfd, 16WV, Electrolytic	1	B
C54	ECEB25V4R7	4.7mfd, 25WV, Electrolytic	1	B
C59	ECEA10V100TZ	100mfd, 10WV, Electrolytic	1	B
VARIABLE CAPACITOR				
C7,17,37,40	PVC2LY20TMN	Tuning Gang, W/Trimmer(C8,18,38,41)	1	A
COMPONENT COMBINATIONS				
M1	EXAF203Z471R	0.01mfd×2, 470Ω	1	B
M2	EXA5DL04C	330mmf×2, 4.7KΩ×2	1	B
SWITCHES				
S1-1～S1-4	RSS41A	Band Selector Switch	1	A
S2-1～S2-3	ESRE134L20Z	Clock Selector Switch	1	A
SPEAKER				
SP	EAS10P55S	10cm(4") PM Dynamic Speaker, 8Ω	1	A
CABINET				
	RYARC707BX1	Cabinet(Complete), Black	1	Ⓝ A
	RYARC707BX18	Cabinet(Complete), White	1	Ⓝ A
	RYMRC707BX1	Cabinet Upper Side(Complete)Black	1	Ⓝ C
	RYMRC707BX18	Cabinet Upper Side(Complete)White	1	Ⓝ C
CA1	RGX9005A	Indicating Plate, Magic Touch Mark & Tone Mark	1	Ⓝ B
CA2	RGP9001A	Escutcheon, Dial & Clock	1	B
CA3	RGP96A	Panel, Cabinet Front	1	Ⓝ B
	RHG910A	Rubber, Panel M'tg.	1	Ⓝ C
CA4	RGB5	Badge, National Mark	1	C
	RGK200A	Indicating Plate, FM-ANT Mark	1	Ⓝ C
CA5	RGX230A	Ornament, NATIONAL PANASONIC Mark	1	Ⓝ B

Ref.No.	Part No.	Description	Per Set (Pcs.)	Remarks
CA6	RGL4A	Panel Light	1	C
CA7	RKF70A	Cover, Cabinet Back, Black	1	B
	RKF70A8	Cover, Cabinet Back, White	1	B
	RGT174C	Name Plate, For Black Cabinet	1	Ⓝ C
	RGT174C1	Name Plate, For White Cabinet	1	Ⓝ C
CA8	RBN65A	Knob, Tone Control(Black)	1	A
	RBN65A1	Knob, Tone Control(White)	1	A
CA9	RBS22A	Knob, Clock Selector(Black)	1	A
	RBS22A1	Knob, Clock Selector(White)	1	A
CA10	RYTRC6551M	Knob, Clock Set Time(Black)	1	A
	RYTRC6551M1	Knob, Clock Set Time(White)	1	A
CA11	RBN63A	Knob, Tuning (Black)	1	A
	RBN63A1	Knob, Tuning (White)	1	A
CA12	RBN64A	Knob, Volume Control(Black)	1	A
	RBN64A1	Knob, Volume Control(White)	1	A
CA13	RBW40A	Knob, Set Alarm & Sleep	2	A
CA14	RSC2075AS	Clock	1	Ⓝ A
	XSN3D8S	Screw, Clock M'tg.	4	C
	XTN3D8B	Screw, Clock M'tg.	2	C
	XTN3D10B	Screw, Cabinet Cover M'tg.	4	C
	RMS5A	Bracket, Speaker M'tg.	1	C
CHASSIS				
	XAM37T150	Dial Light, 7.5V, 0.075A	1	A
	XAMR8T	Dial Light, 6.3V, 0.25A	1	A
	RJA5A	AC Cord, Power Source(Black)	1	B
	RJA5B	AC Cord, Power Source(White)	1	B
	RHR111	Grommet, AC Cord	1	C
	RHR104A	Busing, AC Cord	1	C
	RJF4A	Holder, Dial Light	1	C
	RJS14A	Terminal, EXT. FM Antenna	1	B
	RJJ9B	Jack, Earphone	1	B
	RJS13A	Jack, Multi-Connector	2	B
	RJP27B	Plug, Multi-Connector	2	B
CH1	RDD48-1	Drum, Dial	1	B
	RDF210BS	Shaft, Scale M'tg.	1	C
CH2	RDS4090A	Spring, Dial	2	A
CH3	RDT1194A	Shaft, Tuning	1	A
CH4	RDZ05-3	Cord, Dial, 150cm(59 1/8")	1	B
CH5	RKD126B	Scale, Dial	1	B
	XTN3D10BR	Red Screw, Chassis M'tg.	4	B
	XTW3D10BR	Red Screw, Chassis M'tg.	2	B
	RHG211	Rubber Cushion, Dial Light	1	C
PACKING				
P1	RPP50A	Polyethylene Cover	1	C
P2	RPH83A	Soft Sheet	1	C
	RPN9051A	Pad (Complete)	1	C
P3	RPN684A	Pad A (Supply as RPN9051A)	1	C
P4	RPN685A	Pad B (Supply as RPN9051A)	1	C
P5	RPG512A	Carton Box	1	Ⓝ C
P6	RQX5272	Instruction Book	1	Ⓝ B

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